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IS : 4419 - 1967

(Reaffirmed 2004)

Indian Standard

METHOD FOR DETERMINATION OF DIMENSIONAL STABILITY OF KNITTED FABRICS MADE OF SYNTHETIC FIBRES

UDC 677.66 : 677.494 : 620.163



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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 1

Price RS 2.50

February 1968

Revised Price

Indian Standard

METHOD FOR DETERMINATION OF DIMENSIONAL STABILITY OF KNITTED FABRICS MADE OF SYNTHETIC FIBRES

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(Continued on page 2)

(Continued from page 1)

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Indian Standard

METHOD FOR DETERMINATION OF DIMENSIONAL STABILITY OF KNITTED FABRICS MADE OF SYNTHETIC FIBRES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 14 December 1967, after the draft finalized by the Textile Chemistry Sectional Committee had been approved by the Textile Division Council.

0.2 The knitted fabrics, especially made from synthetic fibres and their blends, are stabilized with the combined effects of heat and moisture. It is desirable to determine the extent to which a fabric has been set in order to assess its suitability for particular purposes.

0.3 Considerable assistance has been derived from B.S. 2959:1958 'Method of test for dimensional stability of warp-knitted nylon fabrics (boiling water test)' issued by the British Standards Institution.

0.4 In reporting the result of a test or analysis made in accordance with standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard prescribes a method for determination of dimensional stability of knitted fabrics made of synthetic fibres and their blends.

2. PRINCIPLE

2.1 A specimen is immersed in boiling water for 30 minutes and any change in dimensions is determined.

3. TERMINOLOGY

3.0 For the purpose of this standard, the following definition shall apply.

3.1 Dimensional Change Percent — The decrease or increase in dimensions (that is, in length or width or both) after subjecting the fabric to the prescribed test, expressed as a percentage of the corresponding dimensions before such test.

*Rules for rounding off numerical values (*revised*).

4. SAMPLING

4.1 Lot — The quantity of textile material purporting to be of one definite type and quality, delivered to one buyer against one despatch note.

4.2 Unless otherwise agreed to between the buyer and the seller, the number of pieces of cloth to be selected at random from a lot shall be as given below. The pieces thus selected shall constitute the *test sample*.

<i>Lot Size</i> (<i>Number of Pieces</i> in the Lot)	<i>Sample Size</i> (<i>Number of Pieces to be</i> <i>Selected</i>)
<i>N</i>	<i>n</i>
up to 100	5
101 „ 300	6
301 „ 500	7
501 „ 800	8
801 and above	9

4.2.1 To ensure randomness of selection, a random number table shall be used. In case such a table is not available, the following procedure shall be adopted:

Starting from any piece count the pieces in the lot as 1, 2, 3, etc, up to r in a systematic manner. Every r th piece thus counted shall be included in the test sample, where r is the integral part of N/n (see 4.2).

5. TEST SPECIMENS

5.1 Draw one test specimen of full width or circumference and measuring not less than 1 m in length from each piece constituting the test sample, taking care (a) that the specimens are not drawn from within 1 m of either end of the piece, and (b) that they are cut and not torn from the piece.

6. CONDITIONING OF TEST SPECIMENS

6.1 Prior to test, the test specimen shall be conditioned to moisture equilibrium in a standard atmosphere at 65 ± 2 percent RH and $27^\circ \pm 2^\circ\text{C}$ temp (see also IS : 196-1950*).

6.2 When the test specimens have been left in such an atmosphere for 24 hours, in such a way as to expose, as far as possible, all portions of the

*Atmospheric conditions for testing (revised).

specimens to the atmosphere, they shall be deemed to have reached moisture equilibrium.

7. APPARATUS

7.0 For the purpose of this test, the following apparatus shall be used.

7.1 A stainless steel or similar smooth-surfaced vessel of suitable size to hold the specimen(s) and water during boiling.

7.2 Glass Scale — A plate glass of 6 mm thickness with dimensions not less than 75×15 cm, on the under-surface of which is marked a scale graduated in centimetres and millimetres, the scale running parallel to and approximately equidistant from the long sides of the glass plate.

NOTE — The scale may be engraved on the glass or it may be printed on a thin transparent film which is fastened to the glass plate in such a way as to cover its entire under-surface uniformly. For convenience in use, handles may be fitted at the ends of the plate but they should be attached in such a way that they do not project below the lower surface of the plate.

7.3 Measuring Table — having a horizontal smooth flat surface, both length and width of the table being at least 10 cm greater than the length of the glass plate referred to in 7.2.

7.4 Marking Ink — conforming to IS : 394-1963*

NOTE — If this is not readily available, cotton sewing thread of contrasting colour and having a colour fastness rating of 5 to washing: Test 1 (see IS : 687-1967†) may be used.

8. QUALITY OF REAGENTS

8.1 Pure chemicals and soft water having a hardness of not more than 50 ppm expressed as calcium carbonate shall be used for the purpose of this test.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

9. PROCEDURE

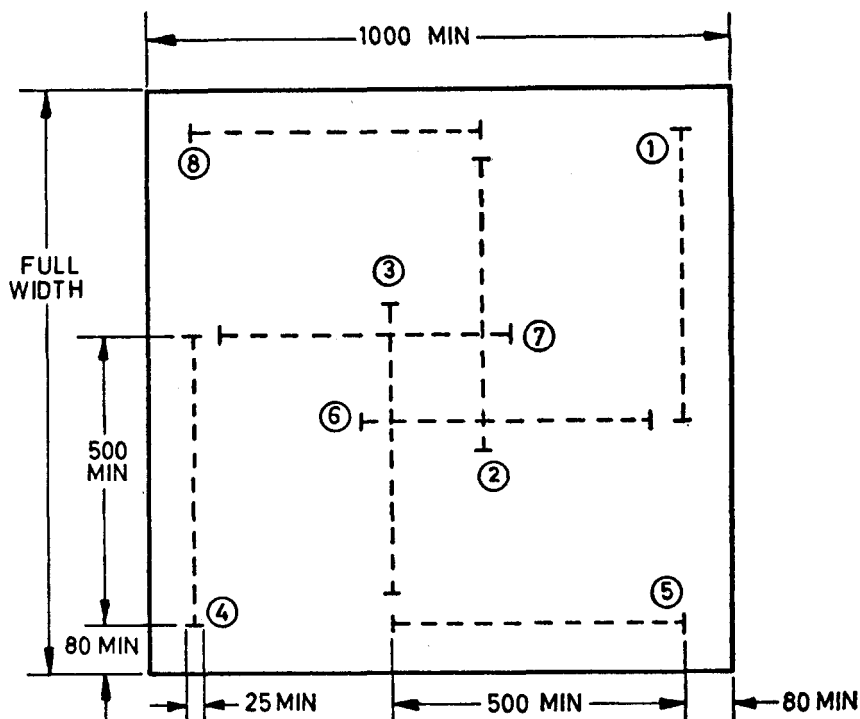
9.1 Preparation and Marking of Specimens — Condition the test specimen to moisture equilibrium in the standard atmosphere (see 6). Weigh and spread it (see Note) on the measuring table, removing by hand all creases and wrinkles taking care not to extend or distort the specimen, and with a fine pointed nib and marking ink (or with cotton sewing thread) mark on it by dotted lines the first, second, third and fourth pairs of marks in the wale direction, and the fifth, sixth, seventh and eighth pairs of marks in the course direction, each mark being at least 25 mm long and at least

*Specification for ink, cloth marking (revised).

†Method for determination of colour fastness of textile materials to washing: Test 1 (first revision).

80 mm away from the edges of the test specimen. Keep the distance between the two marks in every pair the same but not less than 500 mm (or as much greater as the size of the specimen permits) and distribute the pairs of marks across the test specimen, staggering them as illustrated in Fig. 1. Mark one datum point on each of the two marks in the pairs so that the lines joining the datum points on the first, second, third and fourth pairs of marks run parallel to the courses, and the lines joining the datum points on the fifth, sixth, seventh and eighth pairs of marks run parallel to the wales. Join as illustrated in Fig. 1, the datum points on the first, second, third and fourth pairs of marks and the datum points on the fifth, sixth, seventh and eighth pairs of marks by dotted lines, taking care not to distort or extend the specimen. Measure to nearest millimetre the distance between the datum points on all pairs of marks by means of the scale.

NOTE — If the fabric is tubular-knitted, cut the fabric lengthwise and open it before spreading on table. Thereby the circumference of the fabric would be the width of the fabric.



All dimensions in millimetres.

FIG. 1 METHOD OF MARKING OF TEST SPECIMENS

9.1.1 Similarly mark the remaining test specimens and measure the distance between the pairs of marks in each of the remaining specimens. Mark the specimens so that each can be identified from the other.

9.2 Immerse the specimen in sufficient boiling water to prevent undue creasing of the fabric (normally a water to cloth ratio of not less than 50 : 1 will be convenient) and continue boiling for 30 minutes. Remove the fabric gently from the water and then place it flat between two layers of absorbent material, pressing gently with the hand, so as to absorb excess moisture. Allow the fabric to dry by exposing it freely to air while flat and without tension. Condition it to moisture equilibrium in a standard atmosphere (*see 6*). Place it on the measuring table; carefully remove by hand all wrinkles and creases and measure correct to the nearest millimetre the distance between datum points on every pair of marks by means of the glass scale, taking care not to stretch or distort the specimen while measuring.

9.3 Repeat the procedure given as in **9.2** with the remaining test specimens.

10. EVALUATION

10.1 Calculate separately on one test specimen the percentage of dimensional change between datum points on every pair of marks by the following formula:

$$S = \frac{100 (a - b)}{a}$$

where

S = percentage dimensional change,

a = distance between datum points on a pair of marks before treatment (*see 9.1*), and

b = distance between the same datum points after treatment (*see 9.2*).

10.2 Take the mean of the values so determined for the first, second, third and fourth pairs of marks as the courseway dimensional change of the test specimen and the mean of the values determined for the fifth, sixth, seventh and eighth pairs of marks as the waleway dimensional change of the test specimen.

10.3 Determine similarly (*see 10.1 and 10.2*) the courseway and waleway dimensional changes of all the treated test specimens.

11. REPORT

11.1 Report individually the courseway and waleway dimensional changes of each test specimen in the sample.

11.2 Report also whether the change in dimension is shrinkage or extension.

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 Man-Made Fibre Fabrics, Mill-Made
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534 Sardar Vallabhbhai Patel Road
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